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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/986,175 | 11/07/2001 | Chih-Chin Chang | H010013A | 4963 |
| 34003 | 7590 | 10/22/2003 | EXAMINER | |
| INTELLECTUAL PROPERTY SOLUTIONS, INCORPORATED 5717 COLFAX AVENUE ALEXANDRIA, VA 22311 | | | ESTRADA, ANGEL R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2831 | |

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/986,175 | CHANG, CHIH-CHIN | |
| | Examiner | Art Unit | |
| | Angel R. Estrada | 2831 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-14 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishino et al (US 6,133,678, hereinafter Kishino) in view of the applicant's prior art (figures 1-2e).

Regarding claim 12, Kishino discloses a fabrication method for the (FED) Field Emission Display (FED) cathode plate with an internal via (see figure 1), comprising the steps: forming and defining a plurality of cathode conductors (2) and a tape line (7) on a substrate (1) at the same time; depositing a resistive layer (3) to cover the cathode conductors (2); sequentially forming a dielectric layer (8) and a gate line (4) on the resistive layer (3) and the tape line (7); etching the gate line (4) and the dielectric layer (8) to form a cathode plate with a cavity of microtip (5), a hole upon the cavity of microtip (5), an internal via (9), and a contact (see figure 1); sloping the plate to a predetermined angle to form a metal layer (column 8 lines 18-31) on the gate line (7) and the internal via (4) to contact with the tape line by evaporation (column 8 lines 18-31); but Kishino lacks that the predetermined angle is ranged between 10 to 30 degrees and that the microtip is formed by vertical layer evaporation, and lifting off the excessive deposition on the surface of the plate by immersing the plate in a chemical solution.

The applicant's prior art (figures 1-2e) teaches a method of fabricating a field emission display cathode plate (see figure 1) comprising the step of sloping the plate at a predetermined angle between 10 to 30 degrees (page 2 lines 13-15 or see figure 2c); the prior art also teaches a step of forming the microtip by vertical layer evaporation (page 2 lines 15-21) and lifting off the excessive deposition on the surface of the plate by immersing the plate in a chemical solution (see figure 2d and 2e). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide to Kishino with the steps of sloping the plate at a predetermined angle between 10-20 degrees and forming the microtip by vertical layer evaporation as taught by the applicant's prior art to enable forming of the field emission display cathode plate.

Regarding claim 13, Kishino discloses the fabrication method, wherein glass (see figure 1, notice the cross section hatching) is used to form the substrate (1).

Regarding claim 14, Kishino discloses the fabrication method, wherein doped silicon (column 7 lines 8-10) is used to form the resistive layer (3).

Regarding claim 16, Kishino discloses the claimed invention except for the tape line being made of chromium-including metal. The applicant's prior art teaches that the tape line is made of chromium (page 2 lines 30-31 or page 5 "original" column). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the tape line of chromium as taught by the applicant's prior art since this material was conventionally employed for this purpose, as admitted by Applicant.

Regarding claim 17, Kishino disclose the fabrication method, wherein SiO_2 (column 2 lines 25-26) is used to form the dielectric layer (8).

Regarding claim 18, Kishino discloses the fabrication method, wherein molybdenum-including metal (column 2 lines 34-35) is used to form the microtip (5).

Regarding claim 19, Kishino discloses the fabrication method, further comprising the step of joining and sealing the completed cathode plate to an anode with an adhesive (6).

Regarding claim 20, Kishino discloses the fabrication method, wherein the adhesive (6) is glass frit (column 3 lines 4-5).

Regarding claim 21, Kishino discloses claimed invention except for the hole being about 1.6 μ m wide. . It would have been an obvious matter of design choice to change the size of the hole upon the cavity of the microtip to about 1.6 μ m wide, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re. Rose*, 105 USPQ 237 (CCPA 1955).

2. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kishino et al (US 6,133,678, hereinafter Kishino) in view of the applicant's prior art (figures 1-2e) as applied in claim 12, and further in view of Baldi et al (US 6,000,980, hereinafter Baldi)

Regarding claim 15, Kishino teaches the fabrication method, wherein niobium-including metal is used to formed the gate line (column 7 lines19-20), and the metal layer (column 7 lines 25-30); but Kishino lacks the cathode conductor being formed of Niobium. Baldi teaches a FED having a cathode conductor that can be made of any of

various low-resistivity metals including niobium (column 3 line 21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide to the modified Kishino with a cathode conductor being made of niobium as taught by Baldi to improve the electrical conductivity in the FED due to niobium super conductivity characteristics.

Response to Arguments

3. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication should be directed to Angel R. Estrada at telephone number (703) 305-0853. The Examiner can normally be reached on Monday-Friday (8:30 -5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (703) 308-3682. The fax numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for after final communication.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

AE

October 2, 2003

 10/9/03
DEAN A. REICHARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800